SECOR

SECOR
INTERNATIONAL
INCORPORATED

www.secor.com

REMEDIAL ACTION PLAN

Circle K Store No. 2705426

8510 Gravenstein Highway
Cotati, California

July 13, 2005

SECOR

SECOR INTERNATIONAL INCORPORATED www.secor.com

Remedial Action Plan

Circle K Store No. 2705426
8510 Gravenstein Highway
Cotati, California

SECOR Project No.: 77CP. 65426.01.0002

Submitted by:
SECOR International Incorporated
3017 Kilgore Road, Suite 100
Rancho Cordova, CA 95670

Prepared on behalf of:
ConocoPhillips
76 Broadway
Sacramento, California 95818

July 13, 2005

Prepared by:

Thomas Potter
Project Manager

Reviewed by:

Rusty Benkosky, P.E.
Principal Engineer

TABLE OF CONTENTS

1.0 INTRODUCTION 2
2.0 BACKGROUND 3
Previous Environmental Work 3
Groundwater Monitoring 5
Sensitive Receptor Surveys 5
3.0 GEOLOGY 6
4.0 REMEDITAION OBJECTIVES AND CLEANUP GOALS 7
5.0 REMEDIATION SYSTEM DESCRIPTION 8
Dual Phase Extraction 8
Conceptual Remedial Design and Process Flow 8
Final Remedial Design 8
Permitting 9
Pre-Construction Activities 9
Remediation System Installation 10
6.0 PROJECT SCHEDULE 11

LIST OF FIGURES

Figure 1 Site Location Map
Figure 2 Site Plan with Proposed Remediation System and Wells

LIST OF TABLES

Table 1 Soil Boring and Well Construction Details

LIST OF APPENDICES

Appendix A Regulatory Letter
Appendix B Standard Proceedures For Well Instation

1.0 INTRODUCTION

This Remediation Action Plan (RAP) is submitted by SECOR International Incorporated (SECOR) for the Circle K store located at 8510 Gravenstein Highway, Cotati, California (the Site, Figures 1 and 2). This RAP was prepared in response to the Sonoma Department of Health Services (SDHS) letter dated April 6, 2005 (appendix A). Included in this RAP are:

- A site background and summary of environmental investigations and results.
- A summary of the domestic wells on and adjacent to the Site.
- Remedial objectives and cleanup goals.
- A conceptual design of the proposed remedial alternative.
- Project schedule

2.0 BACKGROUND

The site is an active Circle K Store and Service Station located on the southeast corner of the intersection of Gravenstein Highway and Redwood Drive in Cotati, California. Six wells (MW-2, MW-6 through MW-9, and OW) are currently monitored on a quarterly basis at the site. In addition, joint groundwater monitoring has been performed including monitoring ten additional wells at the adjacent ARCO facility.

Previous Environmental Work

Five groundwater monitoring wells (MW-1 through MW-5) were installed at the site to depths of 25 feet below ground surface (bgs) as part of an environmental assessment performed by IT Corporation in 1991. MW-1 and MW-3 through MW-5 were destroyed during the 1994 over-excavation activities. The 1991 report summarizing these events was not available for review by SECOR.

From October 11-14, 1993, Randall and Sons Construction (R&S) removed five steel underground storage tanks (UST) from the site. Total petroleum hydrocarbons as gasoline (TPHg) and diesel (TPHd), as well as benzene, toluene, ethylbenzene, and xylenes (collectively "BTEX compounds") were detected in confirmatory soil samples collected from the sidewalls of the UST excavation. Confirmatory soil samples collected from the sidewalls of the over-excavation area indicated residual hydrocarbon impact remained in the northwestern portion of the excavation.

During October 1994, R&S performed additional over-excavation of approximately 200 cy of soil from the northwestern portion of the initial excavation. TPHd was detected at 65 parts per million (ppm) in a confirmatory soil sample collected from the newly-exposed sidewall in the northwestern portion of the over-excavation. Other analytes were non-detectable.

In December, 1996, Innovative Technical Solutions, Inc. (ITSI) performed a Sensitive Environmental Receptor Survey. The survey included a description of structures, utilities, surface waters, and water supply wells within a 750-foot radius of the site. The utility survey identified sanitary sewer lines, water lines and storm drains near the site. Surface waters identified included seasonal standing water and a culvert. No water supply wells were identified by the study.

Four groundwater monitoring wells (MW-6 through MW-9) and one UST cavity observation well (OW) were installed at the locations depicted on attached Figure 2, subsequent to over-excavation activities. MW-6, MW-7 and MW-8 were installed in January 1996 and MW-9 was installed in April 1997. Four soil borings, SB-1 through SB-4, were also advanced in January 1996. Groundwater monitoring has been on going since January 1996. Historical groundwater analytical results indicate the continued presence of TPHg, TPHd, BTEX compounds, and methyl tertiary butyl ether (MtBE) in groundwater beneath the site, particularly in the northwestern (downgradient) portion of the site.

In December 1999, SECOR submitted a Remedial Alternative Feasibility Study (FS) to the Sonoma County Department of Health Services (SCDHS). After a review of five remedial

alternatives, the FS recommended chemical oxidation as a technically feasible, cost-effective remedial technology for the site. The objective of chemical oxidation treatment was to oxidize BTEX compounds, MtBE, TPHg, and TPHd present in groundwater and aquifer sediments in the impacted areas of the site and vicinity. The FS recommended use of a chemical oxidation treatment called Fenton's reagent (hydrogen peroxide, sulfuric acid, and ferrous iron).

In October 2000, SECOR submitted the results of a well survey conducted within a 1,900-foot radius of the site as requested by the SCDHS. Thirteen wells (eleven of which are used for domestic and/or irrigation water supply purposes) were located within the 1,900-foot search radius around the site. The site was found to fulfill the State Water Resources Control Board (SWRCB) guidelines for a Priority Class A site, due to the presence of dissolved MtBE in groundwater exceeding 10,000 parts per billion (ppb), and a water supply well within 1,900 feet of the site.

On July 11 through 13, 2001, SECOR supervised the installation of eight continuous-core soil borings (GP-1 through GP-6 and GP-8 and GP-9). Groundwater was encountered in the borings at approximately 19 to 21 feet bgs. A distinct deeper aquifer was not encountered. MtBE was detected in soil from one of the borings (GP-1) at a maximum concentration of 0.014 ppm. MtBE was detected in groundwater samples collected from each of the 8 borings at a maximum concentration of 14 ppm, but other fuel oxygenates were not detected in groundwater.

SECOR's August 28, 2001 *Soil and Water Investigation Report*, prepared on behalf of Tosco, recommended that an aquifer test be performed at the site. A letter from the SCDHS, dated October 8, 2001, concurred with that recommendation.

On May 17, 2002, SECOR supervised the installation of monitoring well MW-10 to a depth of 30 feet bgs and subsurface soil samples were collected every five feet. Select soil samples were analyzed for TPHg, BTEX, and fuel oxygenates. The maximum reported concentrations in soil samples were 3.1 milligrams per kilogram (mg/kg) TPHg, 0.0081 mg/kg ethylbenzene, 0.0091 mg/kg xylenes, and 730,000 mg/kg MtBE (via Method 8260). A post-development groundwater sample collected from MW-10 contained 230 micrograms per kilogram (µg/L) ethylbenzene, 180 µg/L xylenes, and 5,000 µg/L MtBE. After MW-10 was installed, a pump test was conducted using MW-10 as the pumping well and MW-2, MW-7, MW-8, MW-9, and OW as observation wells. Estimated aquifer parameters for pumping well MW-10 were as follows:

- transmisissivity: 74.4 ft^2/day
- conductivity: 3.9 ft/day
- zone of influence: 161.7 feet

During May, 2002, SECOR conducted a dual phase extraction (DPE) pilot test using well MW-10. DPE was performed using a 20-horsepower liquid ring vacuum pump connected to a H2 Oil Recovery Systems, Inc. thermal oxidizer unit. The pilot test time was approximately 33 hours. During the DPE test, approximately 24 pounds of TPHg and 0.07 pounds of MtBE were extracted. The estimated radius of influence for MW-10 was 26 feet.

Construction details for site related soil borings and wells are summarized in Table 1.

Groundwater Monitoring

Groundwater monitoring and sampling has been performed quarterly (four times per year) at the site since 1st quarter 1997. Currently, 6 wells are monitored (MW-2, MW-6 through MW-9, and OW) and analyzed for TPHg, BTEX and MtBE.

Sensitive Receptor Surveys

In January 1997, ITSI conducted a Sensitive Environmental Receptor Survey within a 750-foot radius of the site. The survey described the various structures within the search radius. It also described surface water conditions within the search radius. ITSI contacted the City of Cotati Building and Planning Department (CCBPD) to obtain utility maps of the area. The maps included sanitary sewer lines, water lines and storm drain lines. The Department of Water Resources (DWR) was also contacted to see if there were any water supply wells within the search radius. Apparently, DWR redirected ITSI to the Sonoma County Permit and Resource Management Department (SCPRMD). The SCPRMD indicated that there were no permitted water wells within the search radius. Water supply wells constructed prior to 1973 were not required to be permitted. ITSI contacted the CCBPD to obtain a list of addresses that were not receiving the city water supply and no such addresses were located within the search radius.

In October 2000, SECOR conducted a Well Survey within a 1900 foot radius of the site. SECOR contacted DWR and obtained Well Completion Reports for 17 wells located within the search radius. Thirteen are domestic wells, one is an irrigation well, one is an oil test well and two are of unknown use. Well details and radius map were submitted in the Corrective Action Plan dated March 8, 2005.

3.0 GEOLOGY

The site is located approximately 50 miles north of San Francisco, California at an elevation of approximately 100 feet above msl. The site and vicinity consist of generally flat topography with hills to the south reaching elevations of approximately 400 feet above msl. The site lies within the Santa Rosa Plain. Surface geology consists primarily of alluvial fan deposits. The site and vicinity are underlain by Pleistocene to Holocene alluvial fan deposits consisting of fine sand, silt, silty clay, course sand and gravel, with gravel more abundant near the heads of fans. The east-west trending Sebastopol Fault is located approximately 0.4 miles north of the site (Innovative Technical Solutions, 1996).

The subsurface generally consists of silty sand or sand with silt to approximately 5 to 15 feet bgs and clay and silt with variable amounts of sand and gravel to the total depth explored (approximately 45 feet bgs). Laterally discontinuous clean sand and gravel layers, which are <1 to 3 feet thick are present locally, predominantly at depths greater than 15 feet bgs.

4.0 REMEDITAION OBJECTIVES AND CLEANUP GOALS

Final cleanup levels for petroleum hydrocarbons at the site are the maximum contaminant levels (MCL). A request for no further action may be submitted before final cleanup levels are achieved if it is shown that: (1) residual concentrations are at or below levels set by a future Risk Based Corrective Action (RBCA) Assessment evaluation, (2) the groundwater plume is found to be stable or receding, and (3) the chemical constituents of concern will naturally attenuate to the final cleanup levels.

Concentrations of petroleum hydrocarbons in the water-bearing zone are currently above the proposed target cleanup levels and will be addressed by the proposed remedial alternative. The following table presents the proposed clean-up levels and are based on MCLs established by California Department of Health Services.

Constituents of Concern	Final Clean-up Level (ppb)	Source
Benzene	1.0	California Department of Health Services Primary MCL
Toluene	150	California Department of Health Services Primary MCL
Ethylbenzene	700	California Department of Health Services Primary MCL
MtBE	5	California Department of Health Services Secondary MCL

5.0 REMEDIATION SYSTEM DESCRIPTION

Dual Phase Extraction

SECOR proposes to implement DPE to cleanup petroleum hydrocarbons beneath the site. DPE will directly remove petroleum hydrocarbons from the vadose and in the saturated zone beneath the site. The results of the DPE pilot test indicate that this remedial method would effectively remediate the site in a cost-effective manner. Contaminated groundwater will be extracted from the subsurface and treated to remove petroleum hydrocarbons. Extraction of groundwater will lower the water table, create a cone of depression that will limit further off-site migration of dissolved contamination, and expose the contaminated capillary fringe (smear zone) soils for vapor phase extraction.

Conceptual Remedial Design and Process Flow

Wells MW-2, MW-7 and MW-10 and four new extraction wells (EW-1, EW-2, EW-3, and EW-4) are proposed for use as DPE wells. The locations of the proposed extraction wells are shown on Figure 2. These wells are proposed based on an estimated 26-foot radius of influence calculated from DPE pilot testing.

Based on historical soil analytical data, a thermal or catalytic oxidizer will be required to abate extracted vapors. The expected destruction efficiency for the abatement equipment will be at least 95 percent. The thermal oxidizer will be capable of extracting and treating up to 500 cfm of soil vapor from the extraction wells. Influent and effluent petroleum hydrocarbon vapor samples, process temperatures, applied vacuums, and flow rates will be measured as required for permit compliance and to ensure reliable operation of the system. Permit to operate and discharge to the atmosphere will be obtained through the Bay Area Air Quality Management District (BAAQMD).

Based on the low groundwater extraction rates observed during DPE feasibility testing, the proposed DPE system is expected to generate approximately 1-3 gpm from the well array. The proposed groundwater treatment system will include a liquid ring pump (LRP) capable of applying a vacuum of up to 29 inches of mercury vacuum to stingers installed in monitoring wells MW-2, MW-7, and MW-10 and extractions wells EW-1, EW-2, and EW-3. The DPE system and will be capable of treating 5 gallons per minute through three 2,000-pound GAC vessels in series prior to discharge to the sanitary sewer under a publicly owned treatment works (POTW) or national pollutants discharge elimination system (NPDES) permit. Influent and effluent groundwater samples will be analyzed and GWE rates will be measured as required for permit compliance and to ensure reliable operation of the system.

Final Remedial Design

A package of construction design drawings will be prepared for the recommended remedial method. The package will include location drawings for the existing and proposed remediation wells, conveyance trenches, utility connections, and the treatment system

compound. Specified construction details (trench and piping details, wellhead details, instrumentation diagrams, etc.) will also be illustrated.

A construction bid package will prepared, including the design drawings, technical specifications, and general construction conditions to describe the type and extent of construction activities to be performed. The technical specifications will address details of the design not included in the design drawings; including the methods, engineering standards, and materials which must be used by the contractor during construction. The general conditions will present contractual language regarding the requirements. Specifications for extraction and treatment process equipment will be prepared to aid procurement of the equipment.

Permitting

The proposed treatment system will reduce influent vapor concentrations to effluent levels acceptable to the BAAQMD. An application for an authority to construct (ATC) permit for the thermal oxidizer treatment system will be prepared and submitted to the BAAQMD. After an ATC permit is obtained and the system is installed, a source test will be conducted to verify system performance. A permit to operate (PTO) will be obtained at the successful completion of the source test and compliance demonstration.

The proposed system will also reduce influent groundwater concentrations to effluent levels acceptable by the City of Cotati or Regional Water Quality Control Board (as applicable). Either a Publicly Owned Treatment Works (POTW) permit or National Pollutant Discharge Elimination System (NPDES) permit will be obtained for discharge of treated groundwater. A source test will be conducted as required by the permit after the system is installed to verify system performance and permit compliance.

Construction of the treatment equipment compound will meet applicable local building codes and fire department regulations. An approximately 15 feet by 20 feet by 6-foot high, chain-linked fence with slats, will be placed around the remediation equipment and piping manifolds.

Pre-Construction Activities

The construction bid package will be distributed to a minimum of three qualified contractors with experience performing similar projects. A bid walk will be performed to allow potential contractors to view the site and direct questions to the design engineer regarding construction specifications. Competitive bids will be procured from the qualified contractors and the client will select a contractor based on the contractors' capabilities to perform the work and their submitted bid cost.

Process equipment will be procured prior to construction based on the specifications prepared during the design phase. Equipment delivery will be coordinated to meet the construction scheduling needs of the selected contractor.

Remediation Well Installation

SECOR proposes to install four additional extraction wells (EW-1, EW-2, EW-3, and EW-4) as shown in Figure 2. The well locations were selected to address the areas of highest potential residual hydrocarbon concentration and based on an estimated 26-foot radius of influence calculated from DPE pilot testing. The proposed well locations will also provide additional soil and groundwater chemical data to further characterize the Site. Based on prior investigations, groundwater is expected to be present between 5 feet and 10 feet bgs.

The 4-inch diameter wells will be installed using a hollow-stem-auger drilling rig equipped with 10-inch diameter augers. The optimal well construction will be determined in the field based on field observations; however, the wells will generally be constructed with 15 feet of screen placed from approximately 20 feet bgs (ten feet below static groundwater) to 5 feet bgs (5 feet above static water). Blank PVC casing will be installed from the top of the well screen to ground surface. SECOR's standard well installation

Remediation System Installation

The remediation system construction will commence upon procurement of all system construction and operation permits, completion of pre-field activities, and completion of well installation activities. SECOR will provide construction management during construction activities. This includes on-site management of contractor and subcontractor personnel. An experienced representative will be present to document site activities using daily logs and photographic documentation. SECOR will verify compliance with design drawings, construction specifications, building permits, the Site Health and Safety Plan, and construction schedules. Standard operating procedures for well installation are presented in Appendix B.

System Start-up and Shake Down

SECOR will conduct a system start-up and shake down to insure that the DPE system and catalytic oxidizer are working properly. In addition, all fail safe mechanisms and interlocks will be tested to insure the system is capable of automatic shut down during alarm conditions. Once the system is fully operable, official startup will be performed. The system will be monitored and sampled according to the conditions of each of the system operating permits. Data from the startup will be tabulated as necessary to prepare a report, or reports, to fulfill start-up reporting requirements of each permit.

Monthly Catalytic Oxidizer Operation and Maintenance

An operation and maintenance (O&M) manual will be prepared as a stand-alone document to assist personnel maintaining the operation and performing compliance monitoring of the remediation system. The system manual will include as-built drawings, monitoring and maintenance checklists and schedules, troubleshooting guides, and equipment operating manuals. The remediation system will be operated until cleanup goals are achieved or until such a time as the remediation effort is shown to no longer be technically or economically feasible such as when groundwater concentrations reach asymptotic levels. Site clean-up goals may eventually be determined by risk based corrective action assessment.

Throughout the life of the system, its operation will be monitored, at a minimum, to verify permit compliance and to meet permit reporting requirements.

As part of the system operation and maintenance, SECOR will visit the site two times per month to monitor and adjust the DPE extraction rates. Monthly air samples will be collected from the influent and effluent vapor lines and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), TPHg, and MtBE using EPA method 8260. The air sample data will be compiled and tracked to comply with BAAQMD Permit to Operate.

Monitoring and Sampling

Site groundwater monitoring and sampling will continue to be performed on a quarterly basis using the existing well array.

Quarterly Monitoring Reports

Site groundwater monitoring and system efficiency reports will be prepared and submitted on a quarterly basis or in compliance with the air and water discharge permit requirements. System efficiency reporting will include summaries of mass extracted, mass extraction rates, and any modifications to system operation, which may have increased mass extraction rates. Extracted mass will be compared to the estimated mass of hydrocarbons in soil and groundwater prior to remediation and groundwater concentrations will be compared to groundwater cleanup goals to evaluate the progress toward remediation of the Site. The monitoring and sampling results will be summarized into the quarterly report that will include the field notes, copies of the analytical lab results, tables summarizing the field and analytical data, and maps showing the groundwater gradient and chemical concentration results.

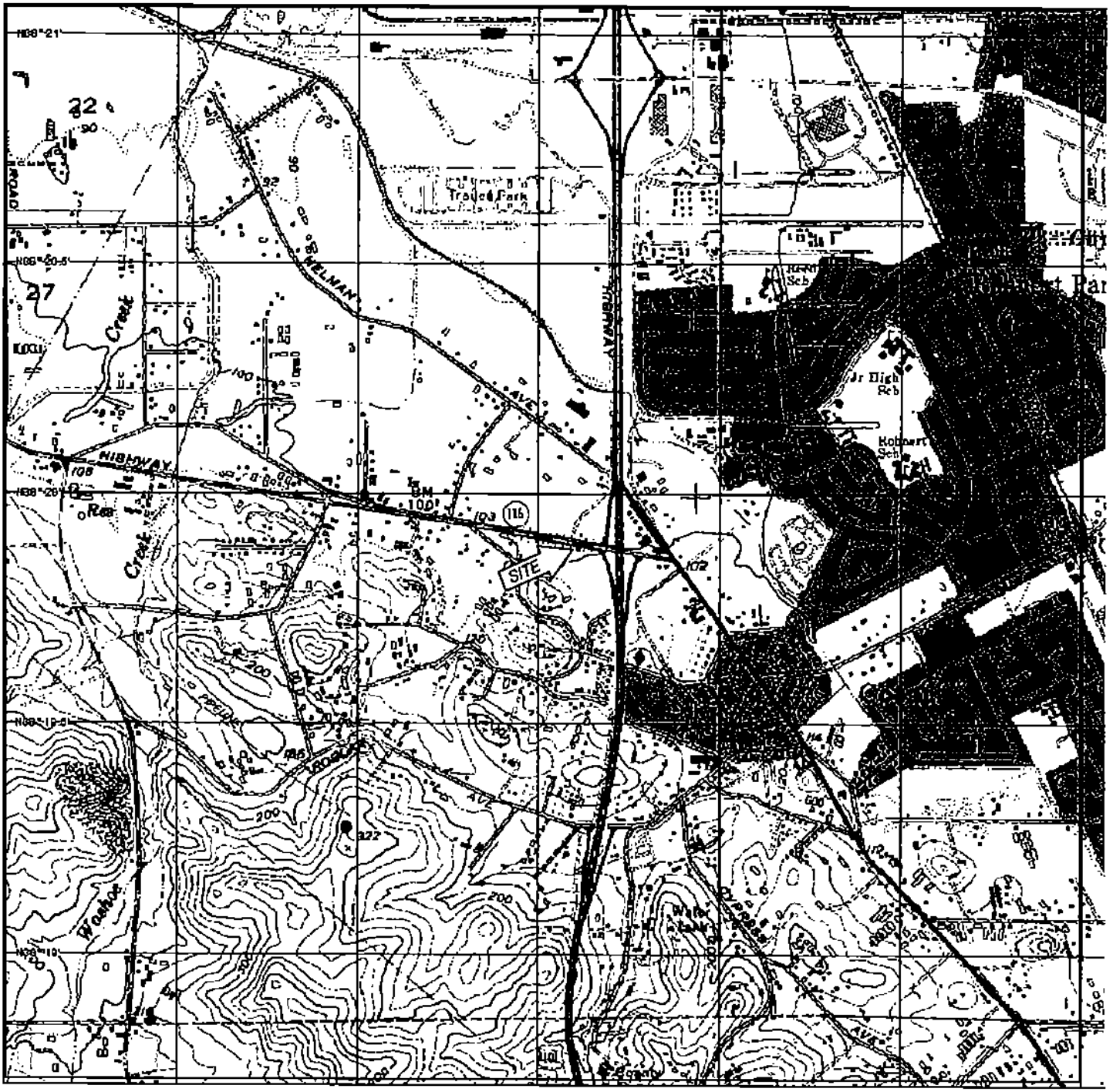
6.0 PROJECT SCHEDULE

The anticipated schedule to complete the tasks contained in this letter is as follows:

- Task 1 – Design DPE system.
- Task 2 – Permit new DPE wells and DPE system.
- Task 3 – Install new DPE wells.
- Task 4 – Install DPE system.
- Task 5 – Startup DPE system.
- Task 6 – Data Compilation and Reporting- One month after final sampling analytical results have been received.

Upon approval of this RAP from SCEHD it is anticipated that implementation will require approximately 3 to 6 months, assuming no major scheduling conflicts. Timing for implementation is dependent on the submittal and approval of remediation system design plans, receipt of necessary permits, and establishing on-site power sources.

FIGURES



REFERENCE: USGS 7.5 MINUTE QUADRANGLE, DELORME, CALIFORNIA

SECOR
3017 KILGORE ROAD, SUITE 100
RANCHO CORDOVA, CALIFORNIA
PHONE: (916) 861-0400/861-0430 (FAX)

FOR:
CONCOPHILLIPS
CIRCLE K STORE NO. 5426

8501 GRAVENSTEIN HIGHWAY
COTATI, CALIFORNIA

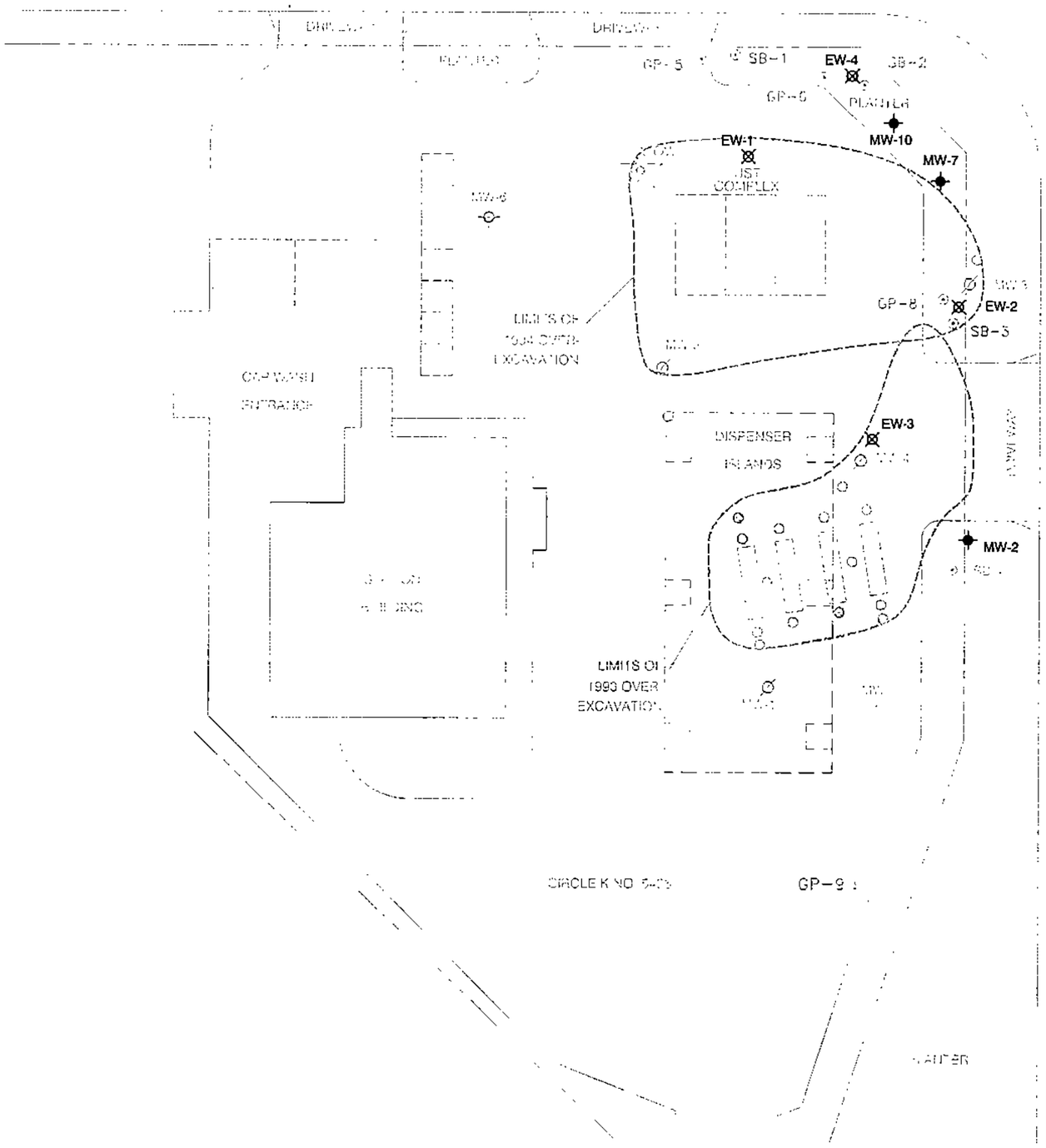
SITE LOCATION MAP

FIGURE: **1**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
77CP.65426.01	MDR	JSA	JSA	7/12/05

FILEPATH:Q:\CADD-77\ConocoPhillips\5426\TB-TOPO 5426.dwg | Layout Tab: Layout1 | Drafter: mramirez | Jul 13, 2005 at 8:16

REDWOOD DRIVE



GRAVENSTEIN HIGHWAY

LEGEND:

☆OW	OBSERVATION WELL (CONOCOPHILLIPS)
✦MW-2	GROUNDWATER MONITORING WELL (CONOCOPHILLIPS)
⊕ GP-1	BORING LOCATION
⊘	DESTROYED WELL
◦	CONFIRMATION SOIL SAMPLE
⊠ EW-1	PROPOSED REMEDIATION WELL (DUAL-PHASE EXTRACTION)
┌ ┐	FORMER UST
------	EXCAVATION LIMIT

N

0 30 60

APPROXIMATE SCALE FEET

SECOR
3017 KILGORE ROAD, SUITE 100
RANCHO CORDOVA, CALIFORNIA
PHONE: (916) 861-0400/861-0430 (FAX)

FOR: CONCOPHILLIPS
CIRCLE K STORE NO. 5426
8510 GRAVENSTEIN HIGHWAY
COTATI, CALIFORNIA

SITE PLAN WITH PROPOSED REMEDIATION WELLS

FIGURE: **2**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
77CP.65426.01	MDR	BH	BH	7/12/05

FILEPATH:Q:\CADD-77\ConocoPhillips\5426\65426-Figure 7 Remediation.dwg | Layout Tab: Layout2-Layout1 | Drafter: mramirez | Jul 13, 2005 at 8:09

TABLES

Table 1
Soil Boring and Well Construction Details

76 Service Station No. 5426
8510 Gravenstein Highway
Cotati, California

Well I.D.	Drill Date	Boring Depth (feet bgs)	Well		Screen		Screen Length (feet)	Interval of Cement Grout (feet bgs)	Interval of Bentonite Seal (feet bgs)	Interval of Sand Pack (feet bgs)
			Depth (feet bgs)	Diameter (inches)	Top (feet bgs)	Bottom (feet bgs)				
Groundwater Monitoring Wells										
MW-1	1991	25	U	U	U	U	U	U	U	U
MW-2	1991	25	U	U	U	U	U	U	U	U
MW-3	1991	25	U	U	U	U	U	U	U	U
MW-4	1991	25	U	U	U	U	U	U	U	U
MW-5	1991	25	U	U	U	U	U	U	U	U
MW-6	01/24/96	20	20	2	5	20	15	0-2	2-3	3-20
MW-7	01/24/96	20	20	2	5	20	15	0-2	2-3	3-20
MW-8	01/24/96	20	20	2	5	20	15	0-1	1-2	2-20
MW-9	04/30/97	19	18	2	4	18	14	0-2	2-3	3-18
MW-10	05/17/02	30	30	4	10	20	10	0-6	6-8	8-30
OW	See Note									
Soil Borings										
GP-1	07/11/01	22	—	—	—	—	—	0-22	—	—
GP-2	07/11/01	46	—	—	—	—	—	0-46	—	—
GP-3	07/11/01	22	—	—	—	—	—	0-22	—	—
GP-4	07/13/01	46	—	—	—	—	—	0-46	—	—
GP-5	07/12/01	22	—	—	—	—	—	0-22	—	—
GP-6	07/12/01	22	—	—	—	—	—	0-22	—	—
GP-8	07/12/01	22	—	—	—	—	—	0-22	—	—
GP-9	07/12/01	46	—	—	—	—	—	0-46	—	—
SB-1	01/25/96	16	—	—	—	—	—	0-16	—	—
SB-2	01/25/96	15	—	—	—	—	—	0-15	—	—
SB-3	01/25/96	15	—	—	—	—	—	0-15	—	—
SB-4	01/25/96	15	—	—	—	—	—	0-15	—	—

Note:
Tank pit well, installation date and construction details unavailable.

Abbreviations:
U = information unavailable
NA=not applicable

Explanation:
All wells are of PVC construction
bgs = Below Ground Surface

APPENDIX A
REGULATORY LETTER

Remedial Action Plan
76 Station No. 2705426
8510 Gravenstein Highway
Cotati, California
SECOR Project No.: 77CP.65426.01.0002

11135 OPE

COUNTY of SONOMA 11220
DEPARTMENT OF HEALTH SERVICES

Rita Scardaci, MPH – Director
Sharon Aguilera – Assistant Director

Environmental Health Division
Walter L. Kruse - Director

April 6, 2005

Mr. David DeWitt
ConocoPhillips
76 Broadway
Sacramento, CA 95818

Re: Review of Corrective Action Plan
8510 Gravenstein Highway, Cotati
Leaking Underground Storage Tank Site
SCDHS-EHD Site #00001670; NCRWQCB Site #1TSO551

Dear Mr. DeWitt:

On March 14, 2005, this Department received the referenced Corrective Action Plan (CAP) dated March 8, 2005 from SECOR International, Inc. Thank you very much for this submittal. We have reviewed the CAP and note that it is recommended to use Dual Phase Extraction (DPE) as the preferred method of soil and groundwater remediation. We generally concur with the work recommended.

You are directed to submit a Remedial Action Plan (RAP) to this Department that provides details for installation, operation and monitoring of the DPE system. **July 8, 2005**, has been established as the due date for submittal of the required RAP.

This Department appreciates the effort you are making to remediate this site. Please contact me at (707) 565-6573 or by e-mail at dradford@sonoma-county.org if you have any questions or wish to discuss this further. My office hours are 7:30 a.m. to 4 p.m., Monday through Thursday.

Sincerely,

Dale Radford

Dale Radford, P.E.
Civil Engineer
Leaking Underground Storage Tank Local Oversight Program

DR

c: Mr. Luis Rivera, North Coast Regional Water Quality Control Board
Mr. David Charter, SWRCB Cleanup Fund
Mr. Tim Johnson, Tosca Refining & Marketing Co., 601 Union Street, Suite 2500
Seattle, WA 98101
Mr. Nadar Shaterian, P. O. Box 69, Cotati, CA 94931-0069
Mr. Robert Bardel, Estate of Dorothy Ramsey, 1922 Filbert Street,
San Francisco, CA 94123

APPENDIX B
STANDARD PROCEDURE FOR WELL INSTALLATIONS

Remedial Action Plan
76 Station No. 2705426
8510 Gravenstein Highway
Cotati, California
SECOR Project No.: 77CP.65426.01.0002

SECOR INTERNATIONAL INCORPORATED

STANDARD PROCEDURE FOR GROUNDWATER MONITORING WELL CONSTRUCTION FOR WELLS SCREENED ACROSS THE PHREATIC SURFACE UNCONFINED AQUIFERS – HOLLOW STEM AUGER METHOD

Groundwater monitoring wells are constructed by inserting or tremming well materials through the annulus of the hollow stem auger. In general, the groundwater monitoring wells are constructed with 15 feet of screen below groundwater and 10 feet above groundwater, for a total screen length of 25 feet. Where shallow groundwater is encountered or perched water dictates otherwise, the screen is adjusted, as appropriate, to maintain a proper seal at the surface (minimum three feet) and to avoid penetrating low permeable horizons or aquicludes. All groundwater wells are installed in accordance with the conditions of the well construction permit issued by the regulatory agency exercising jurisdiction over the project site.

The well screen generally consists of schedule 40 polyvinyl chloride (PVC) casing with 0.01 to 0.02 machine slots. As a general rule, 0.01 inch slots are used in fine-grained silts and clays and 0.02 inch slots are used in coarse-grained materials. The screen is then filter packed with Lonestar 2/12 or No. 3 sand, or equivalent, for the 0.01 and 0.02 inch slots, respectively.

Once the borehole has been drilled to the desired depth, approximately six inches of filter sand are tremmied to the bottom of the boring. The well screen and blank well casing are then inserted through the annulus of the hollow stem augers. The well screen is sandpacked by tremming the appropriate filter sand through the annulus between the casing and augers while slowly retracting the augers. During this operation, the depth of the sand pack in the auger is continuously sounded to make sure that the sand remains in the auger annulus during auger retraction to avoid shortcircuiting the well. The sand pack is tremmied to approximately two feet above the screen, at which time pre-development surging is performed to consolidate the sand pack. Additional sand is added as necessary to assure that the sand pack extends a minimum of two feet above top of screen. Following construction of the sand pack, a two foot thick bentonite seal is tremmied over the sand and hydrated in place. The remainder of the borehole is backfilled with bentonite grout, pellets, or chips. The well head is then capped with a locking cap and secured with a lock to protect the well from surface water intrusion and vandalism.

The well head is further protected from damage with traffic a rated well box in paved areas or locking steel riser in undeveloped areas. The protective boxes or risers are set in concrete. The details of well construction are recorded on well construction logs.

Following well construction, the wells are developed in accordance with agency protocols by intermittently surging and bailing the wells. Development is determined to be sufficient once pH, conductivity and temperature stabilize to within the 10 percent of the previous two readings and turbidity is below 10 NTUs.

Wastewater collected during development is contained in 55-gallon DOT approved drums and stored on site pending laboratory results and disposal. A label is affixed to the drums indicating the contents of the drum, suspected contaminants, date of generation and the monitoring well number from which the waste water was generated.

Standard Procedure for Groundwater Monitoring Well Construction For Wells Screened Across the Phreatic Surface Unconfined Aquifers – Hollow Stem Auger Method (Continued)

To evaluate groundwater gradient and groundwater elevation, the well heads are surveyed to an assumed or legal bench mark depending on the requirements of the project.

Related Procedures:

- *Standard Procedure for Hollow Stem Auger Drilling*
- *Standard Procedure for Soil Sampling—Split Spoon Sampling*
- *Standard Procedure for Equipment Decontamination*